



**US Army Corps  
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## The Army Priority List of At-Risk Species

2009-2010 Status Update

Harold Balbach, Marian Perez-Martinez, and Elizabeth Keane

September 2010





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## Abstract

The US Endangered Species Act (ESA) requires the US Army to safeguard Federally listed Threatened and Endangered Species (TES). When a species occurring on Army training lands becomes Federally listed as “threatened or endangered” under the ESA, measures to protect that species may conflict with Army activities on those lands critical to National defense (training, weapons testing, etc.). The Army’s List of Priority Species at Risk (LPSAR) identifies 65 species that would cause significant mission conflict were they to be listed as threatened or endangered under the ESA. This work investigated the five listing factors identified in ESA Section 4(a)(1) for the species listed on the LPSAR, and reviewed recent US Fish and Wildlife Service findings on the current status of these species, ongoing listing proposals, and other actions that might affect their status. While no species on the LPSAR were moved to listing, newly published 90-day findings have moved three species closer to formal TES status. Results of this work should help target proactive actions, such as participation in conservation agreements to prevent the listing of a Species at Risk (SAR) and to create partnerships with non-Federal agencies through SAR management to take appropriate action.

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## Preface

This study was conducted for the Army Environmental Quality research program (PE 62720A896) under project number 569G93, "SAR Emerging Issues." The HQDA technical representative was Mr Steve Sekscienski, Conservation Branch, Installation Services, OACSIM.

The work was completed by the Ecological Process Branch (CN-N) of the Installations Division (CN), Construction Engineering Research Laboratory (CERL). The CERL Principal Investigator was Dr. Harold Balbach. Marian Perez-Martinez was a student from the University of Puerto Rico, Mayaguez (UPRM), working at CERL under the UPRM 2009 Summer Program. William Meyer is Acting Chief, CEERD-CN-N, and Dr. John T. Bandy is Chief, CEERD-CN. The Technical Director was Alan Anderson, CEERD-CV-T. The Director of CERL is Dr. Ilker Adiguzel.

CERL is an element of the US Army Engineer Research and Development Center (ERDC), US Army Corps of Engineers. The Commander and Executive Director of ERDC is COL Gary E. Johnston, and the Director of ERDC is Dr. Jeffery P. Holland.

## Definitions

The following terms are used as defined here throughout this report:

*Endangered Species:*

An animal or plant species in danger of extinction throughout all or a significant portion of its range.

*Threatened Species*

An animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range (USFWS-ESA 2009).

*Species at risk*

Species not yet Federally listed as threatened or endangered under the ESA, but are either designated as candidates for listing or are regarded by NatureServe as critically imperiled or imperiled throughout their range because are declining in population.

*Priority Species at Risk*

For the Army, those who would have a significant impact on military installations if Federally listed as threatened or endangered.



# 1 Introduction

## Background

The US Endangered Species Act (ESA) (PL 93-205; 16 US Code 1531 et seq., as amended) is a Federal law that addresses the loss of species (including birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees) and their habitats to prevent their extinction due to the human impact on natural ecosystems. The ESA provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found (USEPA 2009). The ESA regulates Federal land use and promotes Federal funding for species protection, in consultation with the US Fish and Wildlife Service (USFWS) and/or the US National Oceanic and Atmospheric Administration Fisheries Service. This law guarantees that actions that these agencies approve, finance, or carry out are not likely to endanger the prolonged existence of any listed species or result in the destruction or bad modification of designated critical habitat of such species.

The ESA also requires the US Army to safeguard Federally listed Threatened and Endangered Species (TES). When a species occurring on Army training lands becomes Federally listed as “threatened or endangered” under the ESA, measures to protect that species may conflict with Army activities on those lands critical to National defense (training, weapons testing, etc.). To prevent such conflicts, the Army has sought information to help supervise and control Threatened, Endangered and Proposed Candidate (TEPC) species, species at risk (SAR), and their habitats. The Army has used this information to compile its List of Priority Species at Risk (LPSAR), which currently contains 65 species.

The USFWS maintains a worldwide list, which, as of 22 July 2009, included 1538 endangered species (602 are plants) and 355 threatened species (148 are plants). This USFWS list has been the primary source to track the updated listing status of the 65 species in the Army’s preliminary LPSAR. This work was undertaken to review the status of the SAR in the Army and in the USFWS listing, and to determine if that status has changed and consequently, if knowledge of SAR has improved.

## Objectives

The objectives of this project were to determine: (1) if the status of SAR has changed in the Army and in the USFWS listing, and (2) if knowledge of these SAR has improved.

## Approach

To determine whether the status of SAR has changed in the Army and in the USFWS listing, the LPSAR was compared to updated USFWS listings to check any changes in status. To measure whether knowledge of these SAR has improved, a rating plan was developed, based on the scientific and data assembled, to support the established ranking criteria, and to update the LPSAR. The rating plan targets species likely to become Federal official candidates for listing. In an effort to avoid unnecessary listing, the report tries to identify the missing gaps of information regarding the Army's priority species that lack updated status or information.

This study was performed through acquisition of records from Army, USFWS, International Union for Conservation of Nature and Natural Resources (IUCN) and NatureServe printed publications and databases. This was supplemented through inquiries made of numerous persons working in the responsible offices who were able to provide verbal direction and recommendations at several places in the course of this work. The primary actions involved the following steps:

1. The most recent Army-generated list of Priority Species of Concern with their Army priority classification were acquired.
2. Any relevant changes of accepted common name and/or genus and species were identified.
3. These resources were used to determine the species for which the USFWS had changed status.
4. Tables listing the current status of species on the Army's LPSAR were compiled.

## Scope

This report was restricted to examination of published records, information posted in the Internet by the USFWS, and records compiled by the Army, based in turn on reports from Army installations. Information provided in this report is collected from the Army Environmental Database-Environmental Quality (AED-EQ) FY 2007 (FY07) report, FR 50 Code of the Federal Regulations (CFR) 17 Dec 2009, and other sources: the Construction Engineering Research Laboratory (CERL), USFWS, NatureServe,

IUCN, and Integrated Taxonomic Information System (ITIS). The US Army Environmental Command (USAEC) obtained necessary data and clarifications from the USFWS, National Oceanic and Atmospheric Administration (NOAA) Fisheries, Headquarters, Department of the Army (HQDA), Major Commands (MACOMs), Installation Management Command (IMCOM), and Army Installations. For the FY07 reporting period, information was collected from a total of 133 installations that have TEPC species either onsite or on contiguous lands. The information obtained gives: the biological description, listing status, taxonomic profile, habitat, threats, among others characteristics, of the 65 species in the Army's preliminary LPSAR.

### **Mode of technology transfer**

It is anticipated that the results of this work will be made available to Army land managers who report any of the Priority Species, i.e., to any land or wildlife manager proposing a project that involves lands containing habitat of any LPSAR-listed species. It is also anticipated that the information in this report may serve as guidance on the site or installation, regional command, or headquarters level to develop policy and make decisions that may affect these species on their lands. This report will be made accessible through the World Wide Web (WWW) at URL:

<http://www.cecer.army.mil>

## 2 Approach

### List of priority species at risk

Each year, installations enter data on TEPC species into the AED-EQ to give HQDA a list of TEPC species that are found on or contiguous to property owned or leased by the Army. The US Department of Defense (DOD) Legacy Program structured a cooperative USFWS and DOD project to identify SAR on military installations. NatureServe prepared the report and delivered it to DOD in 2002 (DOD 2002). In 2004, NatureServe submitted a revised report to DOD that provided more in-depth analyses of SAR within installations and in buffer areas surrounding installations (DOD 2004). Species identified in the report take place on or within a 2-km buffer of a military site. The report does not include all Army installations; it does not capture many Army National Guard sites, or Army Reserve properties other than the Army Reserve installations that are a part of IMCOM.

This information enables the Army to evaluate the status of its TEPC species nationwide, plan for threatened, endangered, proposed and sensitive (TEPS) species expenditures, deal proactively with any potential conflicts between TEPC species and the military mission, and implement proactive conservation measures that benefit candidate species and SAR to prevent their addition to the Threatened and Endangered Species list.

The Army trains on land owned by other military services, and is also required to comply with ESA for actions on these sites. Therefore, the Army's financial responsibility for ESA fulfillment extends beyond Army owned or leased properties. Such lands may have limitations due to listed or proposed species that affect timing, duration, and intensity of training, such as Army National Guard (ARNG) training on Camp Pendleton or Eglin Air Force Base (AFB). A total of 27 distinct candidate species and three proposed (threatened or endangered) species were identified as on-site at 17 installations.

The 2004 report is a useful resource for identifying SAR that may be on or near DOD property. The Army's preliminary LPSAR contains the species where they believe the greatest land use conflicts would be created if they were listed, and thus, the species in greatest need of added study. Table 1 lists the SAR priorities resulting from this report.

Table 1. List of 65 priority SAR with Army and USFWS priority rankings.

Common and Scientific Name	Army Priority	USFWS Priority if a candidate	Installation
Greater Sage-grouse <sup>1</sup> <i>Centrocercus urophasianus</i>	1	6	Yakima Training Center (YTC)
Gopher tortoise <sup>2</sup> <i>Gopherus polyphemus</i>	1	—	Camp Blanding, Fort Stewart, Fort Benning, Fort Gordon, Fort Rucker
Desert cymopterus <i>Cymopterus deserticola</i>	1	—	Fort Irwin
Mohave round squirrel <i>Spermophilus mohavensis</i>	1	—	Fort Irwin
Camp Shelby burrowing crayfish <i>Fallicambarus gordonii</i>	2	—	Camp Shelby
Slickspot peppergrass <i>Lepidium papilliferum</i>	2	—	Orchard Training Site
Regal fritillary butterfly <i>Speyeria idalia</i>	2	—	Fort Indiantown Gap, Fort Riley
Dwarf (wheel) milkweed <i>Asclepias uncialis</i>	2	—	Fort Carson
Golden blazing star <i>Nuttallia (Mentzelia) chrysantha</i>	2	—	Fort Carson
Mardon skipper <sup>1</sup> <i>Polites mardon</i>	2	8	Fort Lewis
Mazama pocket gopher <sup>1</sup> <i>Thomomys mazama</i>	2	3	Fort Lewis
Streaked horned lark <sup>1</sup> <i>Eremophila alpestris strigata</i>	2	3	Fort Lewis
Taylor's checkerspot <sup>1</sup> <i>Euphydryas editha taylori</i>	2	3	Fort Lewis
Red-tailed Prairie leafhopper (Redveined Prairie leafhopper) <i>Aflexia rubranura</i>	2	—	Fort McCoy
Henslow's sparrow <i>Ammodramus henslowii</i>	2	—	Fort McCoy, Fort Riley
Sandhills lily <i>Lilium pyrophilum</i>	2	—	Fort Bragg
Sandhills milk-vetch <i>Astragalus michauxii</i>	2	—	Fort Bragg
Georgia plume <i>Elliottia racemosa</i>	2	—	Fort Stewart
Giant orchid (eulophia) <i>Pteroglossaspis ecristata</i>	2	—	Fort Stewart
Mimic glass lizard <i>Ophisaurus mimicus</i>	2	—	Fort Stewart
Purple baldwina <i>Baldwina atropurpurea</i>	2	—	Fort Stewart

Common and Scientific Name	Army Priority	USFWS Priority if a candidate	Installation
Southern hognose snake <i>Heterodon simus</i>	2	—	Fort Stewart
Striped newt <i>Notophthalmus perstriatus</i>	2	—	Fort Stewart
Texabama croton (Alabama croton) <i>Croton alabamensis</i> var. <i>texensis</i>	2	—	Fort Hood
Louisiana pine snake <sup>1</sup> <i>Pituophis ruthveni</i>	2	5	Fort Polk
Little white whiptail <i>Aspidoscelis gypsi</i>	2	—	White Sands Missile Range (WSMR)
Oscura Mountains Colorado chipmunk <i>Neotamias quadrivittatus oscuraensis</i> ( <i>Tamias quadrivittatus</i> )	2	—	WSMR
White Sands pupfish <sup>3</sup> <i>Cyprinodon tularosa</i>	2	—	WSMR
Desert tortoise <sup>4</sup> <i>Gopherus agassizii</i>	2	—	WSMR, Yuma Proving Ground (YPG)
Rayed bean <sup>1</sup> <i>Villosa fabalis</i>	3	2	Camp Atterbury
Michigan bog grasshopper <i>Appalachia arcane</i>	3	—	Camp Grayling
Dusted skipper <i>Atrytonopsis hianna</i>	3	—	Camp Grayling
Eastern massasauga <sup>1</sup> <i>Sistrurus catenatus</i>	3	9	Camp Grayling
Southwestern Pond turtle <i>Clemmys</i> ( <i>Actinemys</i> ) <i>marmorata pallida</i>	3	—	Camp Roberts
Southern Crawfish frog <i>Rana areolata areolata</i> ( <i>Lithobates areolatus areolatus</i> )	3	—	Camp Swift
Texas Horned lizard <i>Phrynosoma cornutum</i>	3	—	Camp Swift
Comanche Harvester ant <i>Pogonomyrmex comanche</i>	3	—	Camp Swift
Coldwater darter <i>Etheostoma ditrema</i>	3	—	Fort McClellan
Atlantic pigtoe <i>Fusconaia masoni</i>	3	—	Fort Picket
Torrey's mountain mint <i>Pycnanthemum torrei</i>	3	—	Fort Picket
Pickering's morning glory <i>Stylisma pickeringii</i> var. <i>pickeringii</i>	3	—	Fort Dix, Fort Gordon
Emmel's blue butterfly <i>Euphilotes rita emmeli</i>	3	—	Dugway Proving Ground

Common and Scientific Name	Army Priority	USFWS Priority if a candidate	Installation
Leo Penstemon <i>Penstemon leonardii</i> var. <i>patricus</i> ( <i>Penstemon patricus</i> )	3	—	Dugway Proving Ground
Arkansas River feverfew <i>Bolophyta</i> ( <i>Parthenium</i> ) <i>tetraneuris</i>	3	—	Fort Carson
Field locoweed <i>Oxytropis tananensis</i> ( <i>Oxytropis campestris</i> var. <i>varians</i> )	3	—	Fort Wainwright
Alaska starwort <i>Stellaria alaskana</i>	3	—	Fort Wainwright – Donnelly Training Area (TA)
Rusty blackbird <i>Euphagus carolinus</i>	3	—	Fort Wainwright – Donnelly TA
Georgia leadplant <i>Amorpha georgiana</i> var. <i>georgiana</i>	3	—	Fort Bragg
Well's pixie-moss <i>Pyxidantha brevifolia</i>	3	—	Fort Bragg
Hueco Mountains rock daisy <i>Perityle huecoensis</i>	3	—	Fort Bliss
Organ Mountain evening-primrose <i>Oenothera organensis</i>	3	—	Fort Bliss
Bog coneflower <i>Rudbeckia scabrifolia</i>	3	—	Fort Polk
Bleached earless lizard <i>Holbrookia maculata ruthveni</i>	3	—	Fort Polk
White Sands prairie lizard (Southwestern Fence lizard) <i>Sceloporus undulatus cowlesi</i> ( <i>Sceloporus cowlesi</i> )	3	—	WSMR
Aiea <sup>1</sup> <i>Nothoestrum latifolium</i>	3	2	Makua Military Reservation
Blackhook (Blackline) Hawaiian damselfly <sup>1</sup> <i>Megalagrion nigrohamatum nigrolineatum</i>	3	9	Kawailoa TA
Crimson Hawaiian damselfly <sup>1</sup> <i>Megalagrion leptodermus</i>	3	2	Schofield Barracks
Haha <sup>1</sup> <i>Cyanea calycina</i>	3	2	Kawailoa TA, Schofield Barracks, Schofield Barracks (ER)
Hulumoa <sup>1</sup> <i>Korthalsella degeneri</i>	3	2	Makua Military Reservation
Kaulu <sup>1</sup> <i>Pteralyxia macrocarpa</i>	3	2	Kahuku TA, Kawailoa TA, Makua Military Reservation, Schofield Barracks
Kampua'a <sup>1</sup> <i>Hedyotis fluvialis</i>	3	2	Kawailoa TA

Common and Scientific Name	Army Priority	USFWS Priority if a candidate	Installation
Alani <sup>1</sup> <i>Melicope hiiakae</i>	3	2	Kawailoa TA
Boyd's maiden fern <sup>1</sup> <i>Thelypteris (Christella) boydiae</i>	3	8	Kawailoa TA
'Ohe <sup>1</sup> <i>Joinvillea ascendens ssp ascendens</i>	3	3	Kawailoa TA, Schofield Barracks
No common name <sup>1</sup> <i>Platydesma cornuta var cornuta</i>	3	3	Kawailoa TA, Makua Military Reservation, Schofield Barracks
<sup>1</sup> Species are candidates for ESA listing (according to FR 50 CFR 17 16 December 2009) <sup>2</sup> The gopher tortoise is listed as threatened in its western populations (LA, MS, and western AL) and proposed for listing in its eastern population, which is the rest of the southeastern states <sup>3</sup> ESA proposed candidate species for which information in the petition and other readily available is substantial and indicates that listing as threatened or endangered may be warranted. <sup>4</sup> The Mojave population of the desert tortoise is listed as threatened, but the Sonoran population is not now listed, and is considered at-risk for listing.			

On 29 July 2005, HQDA established a strategic plan to manage SAR and their habitats to either avoid the need for Federal listing or prepare installations for imminent listings, which could result in land use restraint and management expenses. The plan specifically focuses on "Category 1" installations, which are those that have the highest Army-wide strategic and enduring military training values (Memorandum 2005). The Army issued the SAR policy and implementing guidance on 15 September 2006. This policy focuses on the proactive conservation of SAR. The goal of the program is to support military readiness and sustainability while furthering conservation of declining species (Memorandum 2006).

## Army LPSAR and USFWS ESA listing

To determine whether the candidates on the LPSAR have been listed under the ESA, the current LPSAR were compared with the most recent information from the USFWS (the 9 November 2009 and 16 December 2009 versions of 50 CFR Part 17). Tables 1 through 6 list the findings.

## Determining priority species

The USFWS assigns each candidate a Listing Priority Number (LPN) of 1 to 12, depending on the magnitude of threats, immediacy of threats, and taxonomic status; the lower the LPN, the higher the listing priority (that is, a species with an LPN of 1 would have the highest listing priority) (50 CFR Part 17). The Army prioritizes the SAR as: high (1), medium (2), and low (3) based on the possible mission impacts and conflicts (i.e., imminent land use conflicts) that these species could cause at the installations. This



rank does not necessarily relate to whether or not the species is a formal candidate for listing. The collected data is intended to support the Listing Risk Factors (LRF) in section 4 of the ESA for the 65 species in the Army's preliminary LPSAR. The rating plan will allow species most likely to become Federal official candidates for listing to be targeted.

In the 9 November and 16 December versions of the Candidate Notice of Review (CNOR) the USFWS present an updated list of plant and animal species native to the United States that were regarded as candidates for or have proposed for addition to the Lists of Endangered and Threatened Wildlife and Plants under the ESA. Tables 2 and 3 contain SAR found on the Army LPSAR and the proposed USFWS actions.

**Table 2. USFWS completed listing actions in FY09.**

Date	Action	Finding	Regulation
2/10/2009	90-day finding on a petition to list the Wyoming pocket gopher as threatened or endangered with critical habitat	Notice of 90-day petition finding, substantial	74 FR 6558 6563
8/28/2009	90-day finding on a petition to list the Sonoran population of desert tortoise ( <i>Gopherus agassizii</i> ) as a distinct population segment (DPS)	With critical habitat Notice of 90-day petition finding, substantial	74 FR 44335 4344
9/09/2009	90-day finding on a petition to list the eastern population of the gopher tortoise ( <i>Gopherus polyphemus</i> ) as threatened	Finding, substantial	74 FR 46401 46406
12/16/2009	90-day finding on a petition to list the white sands pupfish ( <i>Cyprinodon tularosa</i> ) as threatened	90-day finding, substantial information	74 FR 66866 --

**Table 3. USFWS actions (funded but not completed) in FY09 (50 CFR 17 9 November 2009).**

Species	Action
<b><i>Actions Subject to Court Order/Settlement Agreement</i></b>	
Slickspot peppergrass	Final listing determination
Greater sage-grouse	12-month petition finding
<b><i>Actions with Statutory Deadlines</i></b>	
Desert tortoise - Sonoran population	12-month petition finding
Gopher tortoise - eastern population	12-month petition finding
Mojave ground squirrel	90-day petition finding
Striped newt	90-day petition finding
<b><i>High Priority Listing Actions</i></b>	
2 mussels (rayed bean (LPN = 2), snuffbox No LPN)	Proposed listing

To identify missing information about the SAR on the LPSAR, the list was divided into two categories: Reviewed Species (Appendix A) and Unreviewed Species (Appendix B). Reviewed Species have a USFWS profile found in the Environmental Conservation Online System (ECOS). The Unreviewed Species are those that are not listed by the USFWS as candidates for the ESA and/or that do not have much information, and therefore have no listing priority status. Additionally, at least 18 species have had name changes since the list was assembled in September 2006.

The evaluation method consisted of verifying if there is newer information than that reported in the background information about the status and factors that threatens the 65 species Army's preliminary LPSAR. To obtain productive results, the search of substantial information began with the species that:

1. Are rated as Army #1 priority (because of the potential interference with the training and use of the Army's installations)
2. Have "threatened and under review" status
3. Are candidates for ESA listing
4. Are species of concern
5. Are unreviewed species that are of a lower Army priority.

The search focused on obtaining the scientific literature that contains any of the LRF in Section 4 (a)(1) of the ESA, parameters considered by US Army for the LPSAR. Section 4(a)(1) of the ESA states that USFWS must determine whether a species is threatened or endangered because of the following five factors (USFWS 2009):

1. The present or threatened destruction, modification, or curtailment of the species' habitat or range
2. The over-utilization for commercial, recreational, scientific, or educational purposes
3. Any disease or predation
4. The inadequacy of existing regulatory mechanisms
5. Other natural or manmade factors affecting the species' continued existence.

The tables were compiled to form a guide regarding what and how much information appears of every SAR. Both tables contain a row for: the Species Common and Scientific Name, the Army's Priority, Listing Status, Background Information, and Database Research. The "petition" column was removed from this list because this data will be placed in another table. Data was annotated according to the legend listed in Table 4.

Table 4. Legend annotations for priority species.

Symbol	Meaning
X	Indicates information gathered in a notebook and also in electronic folders
●	Indicates information that requires reading and evaluation in the saved web pages and/or reference document of each species
*	Indicates species that are candidates for ESA listing, but they are not necessarily a priority for the Army
+	Indicates information that appears in the species assessment provided in the USFWS Species Profile of the ECOS
■	Indicates species that needs more study to fill the missing gaps of information regarding the five listing factors in Section 4(a)(1) of the ESA about the actual status
◼	Indicates species studied by the Army, therefore the information should be accessed in the Army's database

### 3 Results

#### Changes in common or scientific name

The first step was to identify those species for which the name had been changed between the time the Army LPSAR was originally developed (ca. 2004) and December 2009 (the time of this writing). The issues involved in name changes are many and complex, but several basic reasons why a name changes are that:

1. Taxonomic authorities working with that species or its genus or family decide based on new evidence that a different name is actually the legitimate one for that species
2. These authorities determine that the entity should be combined with another species under a new name
3. An authority may create a new, or resurrect an old, common name for the species that may not have had one previously.

It was found that 18 species on the Army list underwent one or more such changes (Table 5).

#### Examination of status of LPSAR species

At this point of the investigation, information about the established priorities had been gathered. The candidate species for ESA are a public concern managed by the USFWS. Army priority species, which were also candidate species for ESA listing were:

- Mardon skipper (*Polites mardon*),
- Streaked horned lark (*Eremophila alpestris strigata*)
- Taylor's checkerspot (*Euphydryas editha taylori*)
- Louisiana pine snake (*Pituophis ruthveni*)
- Rayed bean (*Villosa fabalis*)
- eastern massasauga (*Sistrurus catenatus*).

These species are a medium (2) Army priority. Since these species are candidates, the information of the listing factors of Section 4(b)(7) of the ESA was gathered in their assessment.

Table 5. Species for which name changed between publication of the Army LPSAR and 2009.

Common/Scientific Name (as shown on 2007 list)	Updated Name
Dwarf milkweed <i>Asclepias uncialis</i>	Wheel milkweed <i>Asclepias uncialis</i> ssp. <i>Uncialis</i>
Golden blazing star <i>Nuttalia chrysantha</i>	Golden blazing star <i>Mentzelia chrysantha</i>
Red-tailed prairie leafhopper <i>Aflexia rubranura</i>	Redveined prairie leafhopper <i>Aflexia rubranura</i>
Giant orchid <i>Pteroglossaspis ecristata</i>	Giant orchid (eulophia) <i>Pteroglossaspis ecristata</i>
Texabama croton <i>Croton alabamensis</i> var. <i>Texensis</i>	Alabama croton <i>Croton alabamensis</i> var. <i>Texensis</i>
Oscura Mountains Colorado chipmunk <i>Neotamias quadrivittatus oscuraensis</i>	Oscura Mountains Colorado chipmunk <i>Tamias quadrivittatus oscuraensis</i>
Eastern massasauga <i>Sistrurus catenatus</i>	Eastern massasauga rattlesnake <i>Sistrurus catenatus catenatus</i>
Southwestern pond turtle <i>Clemmys marmorata pallida</i>	Southwestern pond turtle <i>Emys marmorata pallida</i>
Southern crawfish frog <i>Rana areolata areolata</i>	Southern crawfish frog <i>Lithobates areolatus areolatus</i>
Leo penstemon <i>Penstemon leonardii</i> var. <i>patricus</i>	Leo penstemon <i>Penstemon patricus</i>
Arkansas River feverfew <i>Bolophyta tetraeuris</i>	Arkansas River feverfew <i>Parthenium tetraeuris</i>
No common name <i>Oxytropis tananensis</i>	Field locoweed <i>Oxytropis campestris</i> var. <i>Varians</i>
White Sands prairie lizard <i>Sceloporus undulatus cowlesi</i>	Southwestern Fence lizard <i>Sceloporus cowlesi</i>
Blackhook Hawaiian damselfly <i>Megalagrion nigrohamatum nigrolineatum</i>	Black-lined Hawaiian damselfly <i>Megalagrion nigrohamatum nigrolineatum</i>
No common name <i>Hedyotis fluviatilis</i>	Kampua`a <i>Hedyotis fluviatilis</i>
No common name <i>Melicope hiiaekae</i>	Alani <i>Melicope hiiaekae</i>
No common name <i>Thelypteris boydiae</i>	No common name <i>Christella boydiae</i>
Pilo kea <i>Platydesma cornuta</i> var. <i>corneta</i>	No common name <i>Platydesma cornuta</i> var. <i>corneta</i>

Between the first SAR list (dated March 2006) and the LPSAR (dated September 2006), 11 Hawaiian plants and insects had been removed. It was found that the US Army Garrison–Hawaii (USAG-HI) recommended that the list should include only the recently seen species; their records show that these species has not be seen in almost a decade. However, the installation still includes them in their AED-EQ submissions as being onsite. The species shown in the USFWS records as candidates were:

- Blackhook (Blackline) Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*)
- Crimson Hawaiian damselfly (*Megalagrion leptodermus*)
- Hulumoa (*Korthalsella degeneri*)
- Kaulu (*Pteralyxia macrocarpa*)
- Kampua`a (*Hedyotis fluvialis*)
- Alani (*Melicope hiiakae*)
- Boyd's maiden fern (*Thelypteris [Christella] boydiae*)
- `ohe (*Joinvillea ascendens ssp ascendens*)
- Pilo kea (*Platydesma cornuta var cornuta*).

Species shown as endangered were: Aiea (*Nothocestrum latifolium*) and Haha (*Cyanea calcina*; *Cyanea grimesiana grimesiana*). These species will be included in this report as Priority 3 because they still onsite in an Army installation (USAG-HI).

After analyzing the gathered information, priorities were established. The first groups of species that will be evaluated in this report were:

- The greater sage-grouse (*Centrocercus urophasianus*)
- Gopher tortoise (*Gopherus polyphemus*)
- Desert cymopterus (*Cymopterus deserticola*)
- Mohave ground squirrel (*Spermophilus mohavensis*)
- Camp Shelby burrowing crayfish (*Fallicambarus gordonii*)
- Slickspot peppergrass (*Lepidium papilliferum*)
- Striped newt (*Notophthalmus perstriatus*)
- Desert tortoise (*Gopherus agassizii*).

Of the 65 SAR priorities, supplemental information for 30 species was collected for the five listing factors of Section 4 (a)(1) of the ESA from the following sources: (1) the USFWS assessment of all the candidates for ESA listing, including the Hawaiian species, which are not necessarily a high Army priority at this time; (2) information in new petitions, Cooperative Conservation Agreement (CCA) documents and status reports; and (3) subsequent Army status reports. Figure 1 shows a breakdown of source information on the 65 SARs.

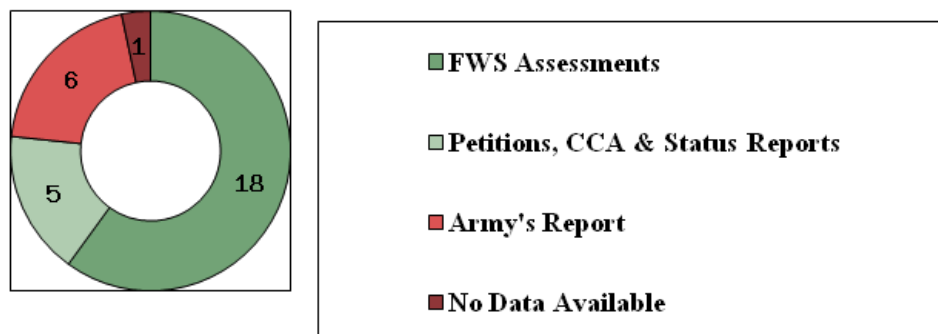


Figure 1. Database research of SAR priorities,

Information about the actual listing status was updated. At this point, there had been progress in getting information related to the five listing factors and/or current status of: (1) the greater sage-grouse, (2) Camp Shelby burrowing crayfish, and (3) the slickspot peppergrass.

According to US Fish and Wildlife Service Mountain-Prairie Region Wyoming Ecological Services Office:

The final decision on whether the greater sage-grouse (*Centrocercus urophasianus*) should be protected under the ESA originally due in May 2009, has been delayed pending new information about the species and its habitat. Publication of this new information is currently expected during the summer of 2009.

The protective measures and management initiated by the US Forest Service and Mississippi National Guard have removed all threats that were the basis of this crayfish's candidate status. These long-term management commitments were formalized in a Candidate Conservation Agreement between the US Forest Service, Mississippi National Guard, the Mississippi Department of Wildlife Fisheries and Parks, and the Service. Consequently, listing the burrowing crayfish species under the ESA is unnecessary; it has been removed from candidate status (USFWS June 2009).

Slickspot peppergrass (*Lepidium papilliferum*) is now under review by the USFWS Regional Office based on new information; it is anticipated that a decision should be reached by the end of July 2010.

## LPSAR and USFWS candidate species

According to USFWS records, 19 of the 65 Army priority species are candidates for listing as threatened or endangered (Table 6). (Table 7 summarizes the USFWS basis for listing priority for candidate species.)

Table 6. USFWS candidate species also on the Army LPSAR.

Species/Scientific Name	USFWS Priority	Army Priority	Installation
Greater sage-grouse <i>Centrocercus urophasianus</i>	6	1	YTC
Mardon skipper <i>Polites mardon</i>	8	2	Fort Lewis
Mazama pocket gopher <i>Thomomys mazama</i>	3	2	Fort Lewis
Streaked horned lark <i>Eremophila alpestris strigata</i>	3	2	Fort Lewis
Taylor's checkerspot <i>Euphydryas editha taylori</i>	3	2	Fort Lewis
Louisiana pine snake <i>Pituophis ruthveni</i>	5	2	Fort Polk
Rayed bean <i>Villosa fabalis</i>	2	3	Camp Atterbury
Eastern massasauga <i>Sistrurus catenatus catenatus</i>	9	3	Camp Grayling
Aiea <i>Nothocestrum latifolium</i>	2	3	Makua Military Reservation
Black-lined Hawaiian damselfly <i>Megalagrion nigrohamatum nigrolineatum</i>	9	3	Kawailoa TA
Crimson Hawaiian damselfly <i>Megalagrion leptodermus</i>	2	3	Schofield Barracks
Haha <i>Cyanea calycina</i>	2	3	Kawailoa TA, Schofield Barracks, Schofield Barracks (ER)
Hulumoa <i>Korthalsella degeneri</i>	2	3	Makua Military Reservation
Kaulu <i>Pteralyxia macrocarpa</i>	2	3	Kahuku TA, Kawailoa TA, Makua Military Reservation, Schofield Barracks
Kampua`a <i>Hedyotis fluvialis</i>	2	3	Kawailoa TA
Alani <i>Melicope hiiakae</i>	2	3	Kawailoa TA
No common name <i>Christella boydiae</i>	8	3	Kawailoa TA
Ohe <i>Joinvillea ascendens ssp ascendens</i>	3	3	Kawailoa TA, Schofield Barracks
No common name <i>Platydesma cornuta var cornuta</i>	3	3	Kawailoa TA, Makua Military Reservation, Schofield Barracks



Table 7. USFWS basis for listing priority for candidate species.

Threat		Taxonomy	Priority
Magnitude	Immediacy		
High	Imminent	Monotype Genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotype Genus	4
		Species	5
		Subspecies/population	6
Moderate to low	Imminent	Monotype Genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotype Genus	10
		Species	11
		Subspecies/population	12

Source: The Endangered Species Act - Listing Under The Endangered Species Act, <http://www.libraryindex.com/pages/3030/Endangered-Species-Act-LISTING-UNDER-ENDANGERED-SPECIES-ACT.html>

### Most recent updates of status (for candidate species)

On 9 November 2009, the USFWS published an update of the current status for the 249 plant and animal species currently considered candidates for listing (74 FR 57804). This notice also identified species that were newly added to the list, that were removed from it, that had undergone changes in their listing priority since the previous review. None of the species on the LPSAR fell in these latter categories.

The following subsections present (or summarize) the information in this review, and include the most recent information available on those candidates species on the Army list. A December publication by the USFWS (74 FR 66866, 16 December 2009) additionally identified 90-day findings for 67 species in the Southwest for which listing was found to be potentially warranted. While these findings were not final, they do indicate that later action is more likely that if it were not so found. One species on the LPSAR falls into this category (the White Sands pupfish); USFWS information for this species is reproduced following that for the candidates below (p 32).

Entries 10-19 of this list describe 10 Hawaiian species reported as on site or adjacent for one of more Army installations. Except for entries 15 and 17, no information is presented beyond that found in the original petitions,

and the updated report thus contains no new information. Apparently, none of these species have been seen on any Army installation for more than 10 years. While it was proposed that these species be dropped from the LPSAR, it was decided to retain them on the list. The information below is reproduced from the Federal Register

**1. Greater sage-grouse (*Centrocercus urophasianus*)  
from 50 CFR 17, 74 FR 57804 – 9 November 2009**

For the reasons discussed below, new information in these findings with regard to the Columbia Basin DPS of the greater sage-grouse in this notice is not included. On 14 May 1999, a petition was received requesting the listing of the Washington population of the western sage grouse (*C. u. phaios*). On 7 May 2001, it was concluded that listing the Columbia Basin DPS of western sage grouse was warranted, but precluded by higher priority listing actions (66 FR 22984); this population was historically found in northern Oregon and central Washington. Following the 7 May 2001 finding, the Service received additional petitions requesting listing actions for various other greater sage-grouse populations, including one for the nominal western subspecies, dated 24 January 2002, and three for the entire species, dated 18 June 2002, and 19 March and 22 December 2003. The Service subsequently found that the petition for the western subspecies did not present substantial information (68 FR 6500), and that listing the greater sage-grouse throughout its historical range was not warranted (70 FR 2244). Legal actions are still pending for these latter findings, which have been remanded to the Service for further consideration. In response, a new rangewide status review was initiated for the entire species (73 FR 10218). These candidate assessments will be updated and a new finding for the Columbia Basin DPS published in the Federal Register following completion of the new range wide status review for the greater sage-grouse.

**2. Mardon skipper (*Polites mardon*)  
from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files and the petition received on 24 December 2002. The Mardon skipper is a northwestern butterfly with a disjunct range. Currently, this species is known from four widely separated regions: south Puget Sound region, southern Washington Cascades, Siskiyou Mountains of southern Oregon, and coastal northwestern California/southern Oregon. The number of documented locations for the species has increased from fewer than 10 in

1997 to more than 130 rangewide in 2009. New site locations have been documented in each year that targeted surveys have been conducted since 1999. In the past 9 years, significant local populations have been located in the Washington Cascades and in Southern Oregon, with a few local sites supporting populations of hundreds of Mardon skippers.

The Mardon skipper spends its entire life cycle in one location, often on the same grassland patch. The dispersal ability of Mardon skipper is restricted. Threats to the Mardon skipper include direct impacts to individuals and local populations by off-road vehicle use, livestock grazing, and pesticide drift. Habitat destruction or modification through conifer encroachment, invasive nonnative plants, roadside maintenance, and grassland/meadow management activities such as prescribed burning and mowing are also threats. However, these threats have been substantially reduced due to protections provided by state and Federal special status species programs. The magnitude of the threats is moderate because current regulatory mechanisms associated with state and Federal special status species programs afford a relatively high level of protection from additional habitat loss or destruction across most of the species' range. Threats are imminent because all sites within the species' range currently have one or more identified threats that are resulting in direct impacts to individuals within the populations, or a gradual loss or degradation of the species' habitats.

Mardon skippers face a variety of threats that may occur at any time at any of the locations. Low numbers of individuals have been found at most of the known locations. Only a few locations are known to harbor greater than 100 individuals, and specific locations could easily be lost by changes in vegetative composition or from the threat of wildfire. The great distances between the known locations for the species would not allow for dispersal of the species between populations; thus, loss of any population could lead to extirpation of the species at any of these locations. However, the discovery of new populations and the wide geographic range for the Mardon skipper provides a buffer against threats that could destroy all existing habitat simultaneously or jeopardize the continued existence of the species. Thus, based on imminent threats of moderate magnitude, an LPN of 8 was assigned to this species.

**3. Mazama pocket gopher (*Thomomys mazama* ssp. *couchi*, *douglasii*, *glacialis*, *louiei*, *melanops*, *pugetensis*, *tacomensis*, *tumuli*, *yelmensis*)**

**From 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files. No new information was provided in the petition received 11 December 2002. Seven of the nine subspecies of pocket gopher are associated with glacial outwash prairies in western Washington, an ecosystem of conservation concern. (*T. m. melanops* is found on alpine meadows in Olympic National Park, and *T. m. douglasii* is found in prairies in extreme southwest Washington.) Of these seven subspecies, five are likely still extant (*couchi*, *glacialis*, *pugetensis*, *tumuli*, and *yelmensis*). Few of these glacial outwash prairies remain in Washington today. Historically, such prairies were patchily distributed, but the area they occupied totaled approximately 170,000 acres. Now, residential and commercial development and ingrowth of woody and/or nonnative vegetation have reduced their numbers. In addition, development in or adjacent to these prairies has likely increased predation on Mazama pocket gophers by dogs and cats.

The magnitude of threat is high due to populations with patchy and isolated distributions in habitats highly desirable for development and subject to a wide variety of human activities that permanently alter the habitat. The threat of invasive plant species to the quality of a highly specific habitat requirement is high and constant. There are few known populations of each subspecies. A limited dispersal capability, and the loss and degradation of additional patches of appropriate habitat will further isolate populations and increase their vulnerability to extinction. Loss of any of the subspecies will reduce the genetic diversity and the likelihood of continued existence of the *Thomomys mazama* subspecies complex in Washington.

The threats are imminent. Two of the subspecies (Cathlamet and Tacoma) are likely extinct. The status of *T. m. douglasii* is unknown, but its habitat is threatened by encroaching development. Two gravel pits are operating on part of the remaining Roy Prairie pocket gopher habitat. The largest populations of two other subspecies (Shelton and Olympia) are located on airports with planned development. Yelm pocket gophers are also threatened by proposed development. Due to its low genetic diversity, isolation, and potential for natural habitat alterations in the future, *T. m. melanops* (Olympic pocket gopher) is susceptible to stochastic events and small population effects such as genetic drift and founder effects. Thus, an LPN of 3 was assigned to these subspecies.

#### **4. Streaked horned lark (*Eremophila alpestris strigata*), from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files. No new information was provided in the petition received on 11 December 2002. The streaked horned lark occurs in Washington and Oregon, and is thought to be extirpated from British Columbia, Canada. The streaked horned lark nests on bare ground in sparsely vegetated sites in short-grass dominated habitats, such as native prairies, coastal dunes, fallow agricultural fields, seasonal wetlands, moderately to heavily grazed pastures, seasonal mudflats, airports, and dredge deposition sites in and along the tidal reach of the Columbia River. In Washington, surveys show that there are approximately 330 remaining breeding birds. In Oregon, the breeding population is estimated at more than 500 birds.

The streaked horned lark's breeding habitat continues to be threatened by loss and degradation due to conversion of native grasslands to other uses (such as agriculture, homes, recreational areas, and industry), encroachment of woody vegetation, and invasion of nonnative plant species (e.g., Scot's broom, sod-forming grasses, and beachgrasses). Native prairies have been nearly eliminated throughout the range of the species. It is estimated that less than 1 to 3 percent of the native grassland and savanna remains. Those areas that remain have been invaded by nonnative sod-forming grasses. Coastal nesting areas have suffered the same fate. A recent purchase of prairie lands in Washington has secured habitat that would have been developed. Its status as suitable lark nesting habitat is unknown.

Wintering habitats are seemingly few, and are susceptible to unpredictable conversion to unsuitable overwintering habitat, plant succession, and invasion by nonnative plants. Where larks inhabit manmade habitats similar in structure to native prairies (such as airports, military reservations, agricultural fields, and dredge-formed islands), or where they occur adjacent to human habitation, they are subjected to a variety of unintentional human disturbances such as mowing, recreational and military activities, plowing, flooding, and dredge material deposition during the nesting season, as well as intentional disturbances such as at the McChord AFB where falcons and dogs are used to haze birds to avoid aircraft collisions. In some areas, however, landowners have taken steps to improve habitat for streaked horned lark nesting.

The magnitude of threat is high due to small populations with low genetic diversity, rapidly declining populations, and patchy and isolated habitats

in areas desirable for development, many of which remain unsecured. The threat of invasive plant species is high and constant, aside from a few restoration sites. The numbers of individuals are low and the numbers of populations are few. Overwintering birds are concentrated in larger flocks and are subject to unpredictable wintering habitat loss (especially in Oregon), potentially affecting a large portion of the population at one time. In Washington, known populations occur on airports, military bases, coastal beaches, and Columbia River islands, where management, training activities, recreation, and dredge material deposition continue to negatively impact streaked horned lark breeding and wintering (although current work being conducted by The Nature Conservancy may lessen this last threat). In Oregon, breeding and wintering sites occur on Columbia River islands, in cultivated grass fields, grazed pastures, fallow fields, roadside shoulders, Christmas tree farms, seasonal wetlands, restored wet prairie, and wetland mudflats. Such areas continue to be subject to negative impacts such as dredge material deposition, development, plowing, mowing, pesticide and herbicide applications, trampling, vehicle traffic, and recreation.

Threats are imminent as a result of continued loss of suitable lark habitat, high nest-predation rates, and low adult survival. Loss of habitat is a result of plans for development on and adjacent to several of its nesting areas, including planned and/or continued expansions of the Fort Lewis Gray Army Airfield West Ramp and the Olympia Airport. Wintering populations are at risk in Oregon due to the manner in which larks gather in large flocks that are vulnerable to stochastic events, and also due to the fact that their wintering habitat occurs on privately owned agricultural lands that are subject to unpredictable conversion. Other ongoing threats include the use of falcons and dogs to haze breeding birds at McChord AFB, the annual Air Force military training Rodeo event on McChord AFB, which included firebombing on top of lark nesting habitat, and the Air Expo on McChord AFB. These two events usually occur in alternate years. Based on imminent threats of a high magnitude, an LPN of 3 was (again) assigned to this subspecies.

**5. Taylor's (Whulge, Edith's) checkerspot butterfly (*Euphydryas editha taylori*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files and in the petition received on 11 December 2002. Historically, the Taylor's checkerspot butterfly was known from 70 locations: 23 in British Columbia, 34 in Washington, and 13 in Oregon. Based on the results of surveys during the 2008 flight period, butterflies were detected in just eight

populations. The total number of Taylor's checkerspot butterflies was considerably reduced in current surveys with approximately 2300 individuals observed rangewide. The latest decline observed was from the Fort Lewis population where fewer than 200 butterflies were counted. Currently, just five populations had butterflies in flight in Washington, two in the Willamette Valley of Oregon, and one on Denman Island, British Columbia, Canada. A new population was observed on the Olympic National Forest.

Threats include degradation and destruction of native grasslands due to agriculture, residential and commercial development, encroachment by nonnative plants, succession from grasslands to native shrubs and trees, and fire. The threat of military training has greatly increased during the past year and the site where Taylor's checkerspot were known to thrive on Fort Lewis was severely affected by Armored Vehicle training. The outcome of the training's effect will not be determined until after this year's monitoring has been completed.

*Bacillus thuringiensis* var. *kurstake* (Btk) was routinely applied for Asian gypsy moth control in Pierce County, WA for many years. This pesticide is documented to have deleterious effects on non-target lepidopteron species, including all moths and butterflies. Because of the timing and close proximity of the Btk application to native prairies where Taylors' checkerspot adults, or their larvae, were historically known to occur, it is likely that the spraying contributed to the extirpation of the subspecies at three locations in Pierce County, WA.

The grassland ecosystem on which this subspecies depends requires annual management to maintain suitable grassland habitat for the species. Important threats include changes to the structure and composition of prairie habitat brought on by the invasion of shrubs and trees (Scot's broom and Douglas-fir) or nonnative pasture grasses that quickly invade prairies when processes like fire, or its surrogate mowing, do not take place. Threats also include the loss of prairies to development or the conversion of native grasslands to agriculture. Vehicle and foot traffic that crushes larvae and larval host plants on roads where host plants have become established are also threats; these areas act as a mortality sink at several of the north Olympic Peninsula sites.

These changes to prairie habitat threaten Taylor's checkerspot by degrading prairie habitat and making it unsuitable for the butterfly. The threats that lead to habitat degradation and loss are ubiquitous, occurring rangewide,

and affect the survival of the subspecies. Therefore, the threats are high in magnitude. The threats are imminent because they are ongoing and occur simultaneously at all of the known locations for the subspecies. Based on the high magnitude and the imminent nature of threats, the Taylor's checkerspot butterfly was (again) assigned a listing priority number of 3.

**6. Louisiana pine snake (*Pituophis ruthveni*)  
from 50 CFR 17, 74 FR 57804 – 9 Nov 2009**

The following summary is based on information contained in researcher files and the petition received on 19 July 2000. The Louisiana pine snake historically occurred in the fire-maintained longleaf pine ecosystem within west-central Louisiana and extreme east-central Texas. Most of the historical longleaf pine habitat of the Louisiana pine snake has been destroyed or degraded due to logging, fire suppression, roadways, short-rotation silviculture, and grazing. In the absence of recurrent fire, suitable habitat conditions for the Louisiana pine snake and its primary prey, the Baird's pocket gopher (*Geomys breviceps*), are lost due to vegetative succession. The loss and fragmentation of the longleaf pine ecosystem has resulted in extant Louisiana pine snake populations that are isolated and small. Trapping and occurrence data indicate the Louisiana pine snake is currently restricted to seven disjunct populations; five of the populations occur on Federal lands and two occur mainly on private industrial timberlands. Currently occupied habitat in Louisiana and Texas is estimated to be approximately 163,000 acres, with 53 percent occurring on public lands and 47 percent in private ownership.

All remnant Louisiana pine snake populations have been affected by habitat loss and all require active habitat management. A CCA was completed in 2003 to maintain and enhance occupied and potential habitat on public lands, and to protect known Louisiana pine snake populations. On Federal lands, signatories of the Louisiana pine snake CCA currently conduct habitat management (i.e., prescribed burning and thinning) that is beneficial to the Louisiana pine snake. This proactive habitat management has likely slowed or reversed the rate of Louisiana pine snake habitat degradation on many portions of Federal lands. The largest extant Louisiana pine snake population exists on private industrial timberlands. Although two conservation areas are managed to benefit Louisiana pine snakes on the private property, the majority of the neighboring occupied habitat is threatened by land management activities (habitat conversion to short-rotation pine plantations) that decrease habitat quality.



Three of the remnant Louisiana pine snake populations may be vulnerable to decreased demographic viability or other factors associated with low population sizes and demographic isolation. Although these remnant Louisiana pine snake populations are intrinsically vulnerable and thus threatened by these factors, it is not known if they are presently actually affected by these threats. Because all extant populations are currently isolated and fragmented by habitat loss in the matrix between populations, there is little potential for dispersal among remnant populations or for the natural recolonization of vacant habitat patches. Thus, the loss of any remnant population is likely to be permanent. Other factors affecting the Louisiana pine snake throughout its range include low fecundity, which magnifies other threats and increases the likelihood of local extirpations, and vehicular mortality, which may significantly affect Louisiana pine snake populations.

While the extent of Louisiana pine snake habitat loss has been great in the past and much of the remaining habitat has been degraded, habitat loss does not represent an imminent threat, primarily because the rate of habitat loss appears to be declining on public lands. However, all populations require active habitat management, and the lack of adequate habitat remains a threat for several populations. The potential threats to a large percentage of extant Louisiana pine snake populations, coupled with the likely permanence of these effects and the species' low fecundity and low population sizes (based on capture rates and occurrence data), lead to the conclusion that the threats have significant effect on the survival of the species and therefore remain high in magnitude. Based on nonimminent, high-magnitude threats, an LPN of 5 was assigned to this species.

#### **7. Rayed bean (*Villosa fabalis*) from USFWS Region 3 Species Assessment and Listing Priority Assignment Form April 2007**

The rayed bean is a small mussel usually less than 1.8 in. long. Shell outline is elongate or ovate in males and elliptical in females, and moderately inflated in both sexes, but more so in females. Key characters useful for distinguishing the rayed bean from other mussels is its small size, thick valves, unusually heavy teeth for a small mussel, and color pattern. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of glacial lakes, including Lake Erie. The rayed bean was historically known from 106 streams, lakes, and some man-made canals in 10 states and three Service regions. The mussel occurred in parts of the upper (i.e., Lake Michigan drainage) and lower Great Lakes systems, and throughout most of the Ohio and Tennessee River systems.

The decline of the rayed bean is primarily the result of habitat loss and degradation. Chief among the causes of decline are impoundments, channelization, chemical contaminants, mining, and sedimentation. The majority of the remaining populations of the rayed bean are generally small and geographically isolated. The patchy distributional pattern of populations in short river reaches makes them much more susceptible to extirpation from single catastrophic events, such as toxic chemical spills. Furthermore, this level of isolation makes natural repopulation of any extirpated population impossible without human intervention. This species was found to be warranted for listing throughout all its range; therefore, it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

The potential impacts of the threats to the rayed bean are at a very high magnitude. Threats from habitat loss and degradation occur throughout the range of the rayed bean. These losses have been well documented since the mid-19th century. Chief among the causes of decline are impoundments, channelization, chemical contaminants, mining, and sedimentation. Bourgeoning human populations will invariably increase the likelihood that many of these factors will continue to impact extant rayed bean populations.

Once a common mussel species, the rayed bean has disappeared from a large portion of its range including the entire Tennessee River system and the rest of its range south of the Ohio River. The primary threats to the rayed bean have occurred in the past, are currently occurring and will continue into the future. The resulting range restrictions and disjunct nature of the populations have been and will be secondarily affecting the species through reduced genetic diversity and limited natural reproduction. Extant populations still occur in the Greater Metropolitan Detroit and Fort Wayne areas, but are probably declining.

The rayed bean is a non-petitioned continuing candidate, and first became a species candidate on 4 May 2004. This species retained an LPN of 2.

#### **8. Eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files. No new information was provided in the petition received on 11 May 2004. The eastern massasauga is one of three recognized subspecies of massasauga. It is a small, thick-bodied rattlesnake that occupies shallow wetlands and adjacent upland habitat in portions of Illinois, Indiana, Io-

wa, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Wisconsin, and Ontario.

Although the current range of *S. c. catenatus* resembles the subspecies' historical range, the geographic distribution has been restricted by the loss of the subspecies from much of the area within the boundaries of that range. Approximately 40 percent of the counties that were historically occupied by *S. c. catenatus* no longer support the subspecies. *S. c. catenatus* is currently listed as endangered or threatened in every state and province in which it occurs, except for Michigan, where it is designated as a species of special concern. Each state and Canadian province across the range of *S. c. catenatus* has lost more than 30 percent, and the majority more than 50 percent, of their historical populations. Furthermore, less than 35 percent of the remaining populations are considered secure. Approximately 59 percent of the remaining *S. c. catenatus* populations occur wholly or in part on public land, and statewide or site-specific Candidate Conservation Agreements with Assurances (CCAAs) are currently being developed for many of these areas in Iowa, Illinois, Michigan, and Wisconsin. In 2004, a CCA with the Lake County Forest Preserve District in Illinois was completed, and in 2005, a CCA with the Forest Preserve District of Cook County in Illinois was completed. In 2006, a Candidate Conservation Agreement with Assurances (CCAA) with the Ohio Department of Natural Resources Division of Natural Areas and Preserves was completed for Rome State Nature Preserve in Ashtabula County.

The magnitude of threats is moderate at this time. However, populations soon to be under CCAs and CCAAs have a low-to-moderate likelihood of persisting and remaining viable. Other populations are likely to suffer additional losses in abundance and genetic diversity and some will likely be extirpated unless threats are removed in the near future. Declines have continued or may be accelerating in several states. Thus the status of this species is being monitored to determine if a change in listing priority is warranted. Furthermore, researchers are working with several experts and partners in the development of an extinction risk model for the subspecies, and the results of this work may indicate that a change in listing priority number is appropriate. Threats of habitat modification, habitat succession, incompatible land management practices, illegal collection for the pet trade, and human persecution are ongoing and imminent threats to many remaining populations, particularly those inhabiting private lands. An LPN of 9 was retained for this subspecies.

**9. Aiea (*Nothocestrum latifolium*) From 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files. No new information was provided in the petition received on 11 May 2004. Aiea is a small tree found in dry to mesic forest and diverse mesic forests on Kauai, Oahu, Maui, Molokai, and Lanai, HI. *Nothocestrum latifolium* is known from 20 steadily declining populations totaling fewer than 1100 individuals. This species is threatened by feral pigs, goats, and axis deer that degrade and destroy habitat and may prey on it; by nonnative plants that compete for light and nutrients; and by the loss of pollinators that negatively affect the reproductive viability of the species. This species is represented in an ex situ collection. Ungulates have been fenced out of some areas where *N. latifolium* currently occurs, and nonnative plants have been reduced in some populations that are fenced. However, these ongoing conservation efforts for this species benefit only a few of the known populations. The threats are not controlled and are ongoing in the remaining unfenced populations. In addition, little regeneration is observed in this species. The threats are of a high magnitude, since they are severe enough to affect the continued existence of the species. The threats are imminent, since they are ongoing. Therefore, an LPN of 2 was retained for this species.

**10. Blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*) From 50 CFR 17, 74 FR 57804 – 9 November 2009**

The listing this species is found to be warranted-but-precluded as of the date of publication of this notice. (Table 8 lists a summary of citations with hyperlinks to their associated web publication.) However, the authors are working on a proposed listing rule that is anticipated to be published before resubmitting the next annual petition 12-month finding.

**11. Crimson Hawaiian damselfly (*Megalagrion leptodemas*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The listing of this species is found to be warranted-but-precluded as of the date of publication of this notice. However, the authors are working on a proposed listing rule that is anticipated to be published before resubmitting the next annual petition 12-month finding.

Table 8. Summary of citations.

Date	Citation Page	Title
11/09/2009	74 FR 57803 57878	<u>Review of native species that are candidates for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions</u>
12/10/2008	73 FR 75175 75244	<u>Review of native species that are candidates for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; proposed rule</u>
12/06/2007	72 FR 69033 69106	<u>Review of native species that are candidates for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; proposed rule</u>
09/12/2006	71 FR 53755 53835	<u>Review of native species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions</u>
05/11/2005	70 FR 24869 24934	<u>Endangered and threatened wildlife and plants; review of native species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; proposed rule</u>
05/04/2004	69 FR 24875 24904	<u>Review of species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions</u>
06/13/2002	67 FR 40657 40679	<u>Endangered and threatened wildlife and plants; review of species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on recycled petitions; annual description of progress on listing actions</u>
10/30/2001	66 FR 54807 54832	<u>Endangered and Threatened Wildlife and Plants (ETWP); review of plant and animal species that are candidates or proposed for listing as endangered or threatened, annual notice of findings on recycled petitions, and annual description of progress on listing actions; proposed rule</u>
10/25/1999	64 FR 57533 57547	<u>Review of plant and animal taxa that are candidates or proposed for listing as endangered or threatened; annual notice of findings on recycled petitions; annual description of progress on listing actions</u>
09/19/1997	62 FR 49397	<u>Review of plant and animal taxa</u>
02/28/1996	61 FR 7595 7613	<u>ETWP; review of plant and animal taxa that are candidates for listing as endangered or threatened species</u>
11/15/1994	59 FR 58982 59028	<u>ETWP; animal candidate review for listing as endangered or threatened species.</u>
11/21/1991	56 FR 58804 58836	<u>ETWP; animal candidate review for listing as endangered or threatened species: 56 fr. 58804 58836</u>
01/06/1989	54 FR 554 579	<u>ETWP; animal notice of review: 54 fr. 554 579</u>
05/22/1984	49 FR 21664 21675	<u>Review of invertebrate wildlife for listing as endangered or threatened species; 49 fr. 21664-21675</u>

**12. Haha (*Cyanea calycina*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The listing this species is found to be warranted-but-precluded as of the date of publication of this notice. However, the authors are working on a proposed listing rule that is anticipated to be published before resubmitting the next annual petition 12-month finding.

**13. Hulumoa (*Korthalsella degeneri*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The listing this species is found to be warranted-but-precluded as of the date of publication of this notice. However, the authors are working on a proposed listing rule that is anticipated to be published before resubmitting the next annual petition 12-month finding.

**14. Kaulu (*Pteralyxia macrocarpa*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The listing this species is found to be warranted-but-precluded as of the date of publication of this notice. However, the authors are working on a proposed listing rule that is anticipated to be published before resubmitting the next annual petition 12-month finding.

**15. Kamapuaa (*Hedyotis fluviatilis*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files. No new information was provided in the petition received on 11 May 2004. Kamapuaa is a scandent shrub found in mixed shrubland to wet lowland forest on Oahu and Kauai, HI. This species is known from 12 populations totaling 1000 to 1400 individuals. *Hedyotis fluviatilis* is threatened by pigs and goats that degrade and destroy habitat, and by nonnative plants that outcompete and displace it. Landslides are a potential threat to populations on Kauai. This species is represented in ex situ collections; however, there are no other conservation actions implemented for this species. An LPN of 2 was retained because the severity of the threats to the species is high and the threats are ongoing and, therefore, imminent.

**16. Alani (*Melicope hiiakae*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The listing this species is found to be warranted-but-precluded as of the date of publication of this notice. However, the authors are working on a proposed listing rule that is anticipated to be published before resubmitting the next annual petition 12-month finding.

**17. No common name (*Christella boydiae*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files. No new information was provided in the petition received on 11 May 2004. This species is a small- to medium-sized fern found in mesic to wet forest along streambanks on Oahu and Maui, HI. Historically, this species was also found on the island of Hawaii, but it has been extirpated there. Currently, this species is known from five populations totaling 316 individuals. This species is threatened by feral pigs that degrade and destroy habitat and may eat this plant, nonnative plants that compete for light and nutrients, and stream diversion. Feral pigs have been fenced out of the largest population on Maui, and nonnative plants have been reduced in the fenced area. No conservation efforts are under way to alleviate threats to the other two populations on Maui, or for the two populations on Oahu. This species is represented in an ex situ collection. The magnitude of the threats acting on the currently extant populations is moderate because the largest population is protected from pigs, and nonnative plants have been reduced in this area. The threats are ongoing and therefore imminent. Therefore, an LPN of 8 was retained for this species.

**18. Ohe (*Joinvillea ascendens* ssp. *ascenden*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The following summary is based on information contained in researcher files. No new information was provided in the petition received on 11 May 2004. Ohe is an erect herb found in wet to mesic *Metrosideros polymorpha*-*Acacia koa* (ohia-koa) forest on the islands of Kauai, Oahu, Molokai, Maui, and Hawaii, HI. Ohe is known from 38 widely scattered populations totaling approximately 180 individuals throughout its range. Plants are typically found as only one or two individuals, with miles between populations. This subspecies is threatened by destruction or modification of habitat due to pigs, goats, and deer, and by nonnative plants that outcompete and displace native plants. Predation by pigs, goats, deer, and

rats is a likely threat to this species. Landslides are a potential threat to populations on Kauai and Molokai. Seedlings have rarely been observed in the wild. Seeds germinate in cultivation, but most die soon thereafter. It is uncertain if this rarity of reproduction is typical of this subspecies, or if it is related to habitat disturbance. Feral pigs have been fenced out of a few of the populations of this subspecies, and nonnative plants have been reduced in a few populations that are fenced. However, these threats are not controlled and are ongoing in the many remaining, unfenced populations. This species is represented in ex-situ collections. The threats are of high magnitude because habitat degradation, nonnative plants, and predation result in mortality or adversely affect the reproductive capacity of the majority of populations of this species. The threats are ongoing, and thus are imminent. Therefore, an LPN of 3 was retained for this subspecies.

**19. No common name (*Platydesma cornuta* var. *cornuta*) from 50 CFR 17, 74 FR 57804 – 9 November 2009**

The listing this species is found to be warranted-but-precluded as of the date of publication of this notice. However, the authors are working on a proposed listing rule that is anticipated to be published before resubmitting the next annual petition 12-month finding.

**New Potential Candidate: White Sands Pupfish (*Cyprinodon tularosa*)**

The following species on the Army LPSAR (the White Sands pupfish) was reported by the USFWS (50 CFR Part 17, 74 FR 66866 – 16 December 2009) as having been assessed, in a 90-day finding, as showing credible evidence that listing may be warranted. The published information contained in the 16 December finding for this species is reproduced here. This does not automatically mean that the species will become candidates for listing, but moves it closer to that status.

The White Sands pupfish occurs in Lincoln, Otero, and Sierra Counties, NM (NatureServe 2007). The species is abundant where its habitat occurs in the Tularosa Basin within the White Sands Missile Range and Holloman AFB, where the White Sands pupfish typically occurs in clear, shallow water over a variety of substrates, ranging from sand and gravel to silt and mud (NatureServe 2007, US Army et al. 2006).



*Factor A*

NatureServe (2007) identifies habitat alteration as a threat to the White Sands pupfish. According to NatureServe (2007), feral horses degrade aquatic habitats; however, no further discussion was provided. No available information indicated that feral horses occur in that portion of the Tularosa Basin; however, information in researcher files indicates that oryx (*Oryx gazelle*), an exotic African ungulate, occurs and breeds year long in the area (Rowley 2001). NatureServe (2007) states that missile impact in pupfish habitat may affect or eliminate a population. Information in researcher files indicates that missile firing activity occurs in the area (US Army et al. 2006). According to NatureServe (2007), surface water withdrawal is prohibited, but military activities, such as road construction, may require the use of groundwater, which may affect the quality of aquatic habitats. NatureServe (2007) states that introduced salt cedar (*Tamarix* spp.) has spread throughout the area occupied by the pupfish and may affect water levels or suitability of pupfish habitat. NatureServe (2007) states that the use of off-road vehicles by recreationalists or for military activities is a threat to the species; however, no further discussion is provided.

*Factors B and C*

No information was presented in the petition concerning threats to this species from these factors.

*Factor D*

The White Sands pupfish is managed under the implementation of a management plan jointly administered by the New Mexico Department of Game and Fish (NMDGF), the Service, the US National Park Service, Holloman AFB, and White Sands Missile Range (NatureServe 2007). Information on the effectiveness of the implementation of this management plan was not available; however, it will be evaluated more thoroughly during the status review for the species.

*Factor E*

No information was presented in the petition concerning threats to this species from this factor.

*Conclusions regarding the White Sands pupfish*

Based on the evaluation of the information provided in the petition, it was determined that the petition presents substantial information to indicate that listing the White Sands pupfish may be warranted, resulting from an exotic ungulate, missile-firing activity, water withdrawal, and the introduced plant salt cedar.

## 4 Conclusions and Recommendations

### Conclusions

This project undertook to determine if the status of SAR has changed in the Army's LPSAR and in the USFWS lists, and whether knowledge of these SAR has improved. This work concludes that, generally, changes to the status of SAR on the Army's LPSAR and in the USFWS lists have moved very slowly during this period (between 2007 and 2009) with respect to listing actions involving this set of species. None of the Army's priority species advanced from candidate to listed status. All 18 of the species that were formal candidates for listing at the beginning of the period remained in that status.

The Army priority list contains 18 candidate species, seven of which are found in the Continental United States and the remaining 11 in Hawaii. Those species found in Hawaii have not actually been reported from Army property for 10 to 20 years, and thus may or may not represent real concern if listed.

On the surface level, the pace of taxonomic revision has affected even the fairly small set of species listed in the LPSAR. Eighteen of the 65 species on the Army list underwent some type of change in scientific or common name in this rather short period (2007-2009). This means that simplistic searches in databases and on the internet for information on status and other biological data may fail, or show a false negative because of such a change.

However, in this time frame, there were also four 90-day finding reports (all in 2009) for Army priority species that found that the information presented in listing petitions likely warranted listing:

1. The Wyoming Pocket Gopher
2. The Sonoran Population of Desert Tortoise
3. The Eastern Population of the Gopher Tortoise
4. The White Sands Pupfish.

Also, the listing priority for some of these species is rather high (2 or 3), so that the change could be made rapidly if USFWS priorities change.

## Recommendations

While the 90-day petitions do not represent final findings, they do in effect move the cited species closer to candidate status. It is recommended that the Army increase management efforts to improve their survival, and/or to enter into agreements with other agencies to manage their populations cooperatively, as through a Candidate Conservation Agreement. To achieve clearer knowledge about the listing status of SAR priorities, it is also recommended that unreviewed species be studied to fill in the missing data gaps regarding the Army's SAR priorities.

The Army's LPSAR is an important tool in prioritizing conservation efforts, including the use of Candidate Conservative Agreements (CCAs) between the USFWS, the Army, and one or more public or private parties to identify species that need further study to prevent their listing as TES. CCA are voluntary conservation agreements in which the Service works with its Federal and non-Federal partners to identify threats to candidate species (or species likely to be listed as candidates), to plan measures needed to stabilize and conserve them, to develop agreements with willing landowners, and to monitor the effectiveness of implemented measures.

CCAs should be proactively managed to implement conservation methods that address each species' specific requirements. For example, the Camp Shelby burrowing crayfish has been removed from candidate status because a CCA between the US Forest Service, the MS National Guard, the MS Dept of Wildlife Fisheries and Parks and the Service removed all threats that were the basis of this crayfish's candidate status. Also, the Louisiana pine snake CCA was cited in the November 2009 candidate summary as a "benefiting" species, even though the summary concluded that significant threats to this species still exist. Such conservation efforts should describe the nature of threats with a high degree of certainty. To achieve this end, it is recommended that the Army work to:

1. Establish more accurate tracking of status changes, including changes in names, for Army priority SAR
2. Establish adequate levels of funding, staffing, and other resources, especially to proactively manage SAR not listed under the ESA
3. Develop a monitoring schedule to track population and distribution of priority SAR, and to report changes to a central repository
4. Apply principles of adaptive management for these species that include voluntary participation of all parties involved in implementing the conservation efforts.

## Acronyms and Abbreviations

<u>Term</u>	<u>Definition</u>
AED	Army Environmental Database
AED-EQ	Army Environmental Database – Environmental Quality
AFB	Air Force Base
ARNG	Army National Guard
CCA	Cooperative Conservation Agreement
CCAA	Candidate Conservation Agreement with Assurances
CEERD	US Army Corps of Engineers, Engineer Research and Development Center
CERL	Construction Engineering Research Laboratory
CFR	Code of the Federal Regulations
CNOR	Candidate Notice of Review
CONUS	Continental United States
DC	District of Columbia
DOD	US Department of Defense
DPS	Distinct Population Segment
ECOS	Environmental Conservation Online System
ER	Emergency Room
ERDC	Engineer Research and Development Center
ESA	US Endangered Species Act
ETWP	Endangered and Threatened Wildlife and Plants
FR	Federal Register
FY	fiscal year
HQDA	Headquarters, Department of the Army
IMCOM	Installation Management Command
ITIS	Integrated Taxonomic Information System
IUCN	International Union for Conservation of Nature and Natural Resources
LPN	Listing Priority Number
LPSAR	List of Priority Species at Risk
LRF	Listing Risk Factors
NMDGF	New Mexico Department of Game and Fish
NOAA	National Oceanic and Atmospheric Administration
PL	Public Law
SAR	Species at Risk
TA	Training Area
TEPC	Threatened, Endangered and Proposed Candidate
TEPS	threatened, endangered, proposed and sensitive
TES	threatened and endangered species
TR	Technical Report
UPRM	University of Puerto Rico, Mayaguez

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<u>Term</u>	<u>Definition</u>
URL	Universal Resource Locator
USAEC	US Army Environmental Command
USAG	US Army Garrison
USAG-HI	US Army Garrison–Hawaii
USFWS	US Fish and Wildlife Service
WAFWA	Western Association of Fish and Wildlife Agencies
WSMR	White Sands Missile Range
WWW	World Wide Web
YPG	Yuma Proving Ground
YTC	Yakima Training Center

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